

AD-A036 113

ARMY MEDICAL RESEARCH INST OF INFECTIOUS DISEASES FR--ETC F/G 13/7
CONSTRUCTION OF A GENERATOR FOR DRY AEROSOLS, (U)
FEB 77 R FONTANGES, J - FOURNIER

UNCLASSIFIED

USAMRIID-MUL-0447

NL

1 OF 1
ADA036113



END

DATE
FILMED
3 - 77

ADA036113

(12)

AD

(14) USAMRIID-MUL-0447

TRANSLATION NO.: MUL 0447

TITLE:

(2) Construction of a generator for dry aerosols

AUTHOR(S): (10) R. Fontanges, ~~R.~~ and J.-M. Fournier

(11) 22 Feb 77

(12) 5p.

REFERENCE:

Travaux Scientifiques, ^{Neon} Annee 1971, Centre de Recherches du Service de Sante des Armees, pp. 301-302

DISTRIBUTION STATEMENT

Approved for public release;
distribution unlimited

DDC
RECEIVED
Feb. 28 1977
REGULATED
C

U. S. ARMY MEDICAL RESEARCH INSTITUTE OF INFECTIOUS DISEASES

Fort Detrick, Frederick, Maryland 21701

COPY AVAILABLE TO DDC DOES NOT
PERMIT FULLY LEGIBLE PRODUCTION

405039

VB

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Construction of a generator for dry aerosols		5. TYPE OF REPORT & PERIOD COVERED Translation
		6. PERFORMING ORG. REPORT NUMBER MUL 0447
7. AUTHOR(s) Fontanges, R. and J.-M. Fournier		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Travaux Scientifiques, Annee 1971, Centre de Recherches du Service de Sante des Armees, pp. 301-302		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS USAMRIID Library, Ft. Detrick, Frederick, Md.		12. REPORT DATE 22 Feb 77
		13. NUMBER OF PAGES 3
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report)
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release: Distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Aerosols, dry Generator for aerosols		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		

K98. CONSTRUCTION OF A GENERATOR FOR DRY AEROSOLS

by R. FONTANGES, and J.-M. FOURNIER

TRAVAUX SCIENTIFIQUES, ANNEE 1971, CENTRE DE RECHERCHES DU SERVICE DE SANTE
DES ARMEES, pp. 301-302.

(Translated by Phebe W. Summers)

OBJECTIVE

△ Vaccination by dried antigen aerosols necessitates use of generators for solid particles of controlled size. This should be between 1 and ^{micrometers} ~~5~~ ¹⁰ In this case, the antigens could reach the lower respiratory passages and instigate local immunity.

APPROACH

③ Production of liquid aerosols at controlled size is well known. On the contrary, it is very difficult to obtain a homogeneous powder and disperse it in aerosol form for inhalation. Phenomena of coalescence and hydration develop and the kinetics of settling are not very reproducible. The apparatus which we have used for the problem in the Microbiology Division seems to respond to the specific criteria ~~we have~~ ^{THAT HAS BEEN} established.

---- optimum sizing between 2 and 3 μg ,

---- rapid delivery,

---- easy manipulation.

RESULTS (Fig. 1 and 2)

The solid aerosol generator constructed according to our plan functions according to the principal of blast-pipe grinder which reduces the dried product to fine particles by action of jets of compressed fluid (air or nitrogen, for example) in a circular chamber called a micronizer.

Accession for	File Section	Box Section	
File			
Box			
Distribution/Availability Codes			
Dist.	Attn. and/or Sec. Code		

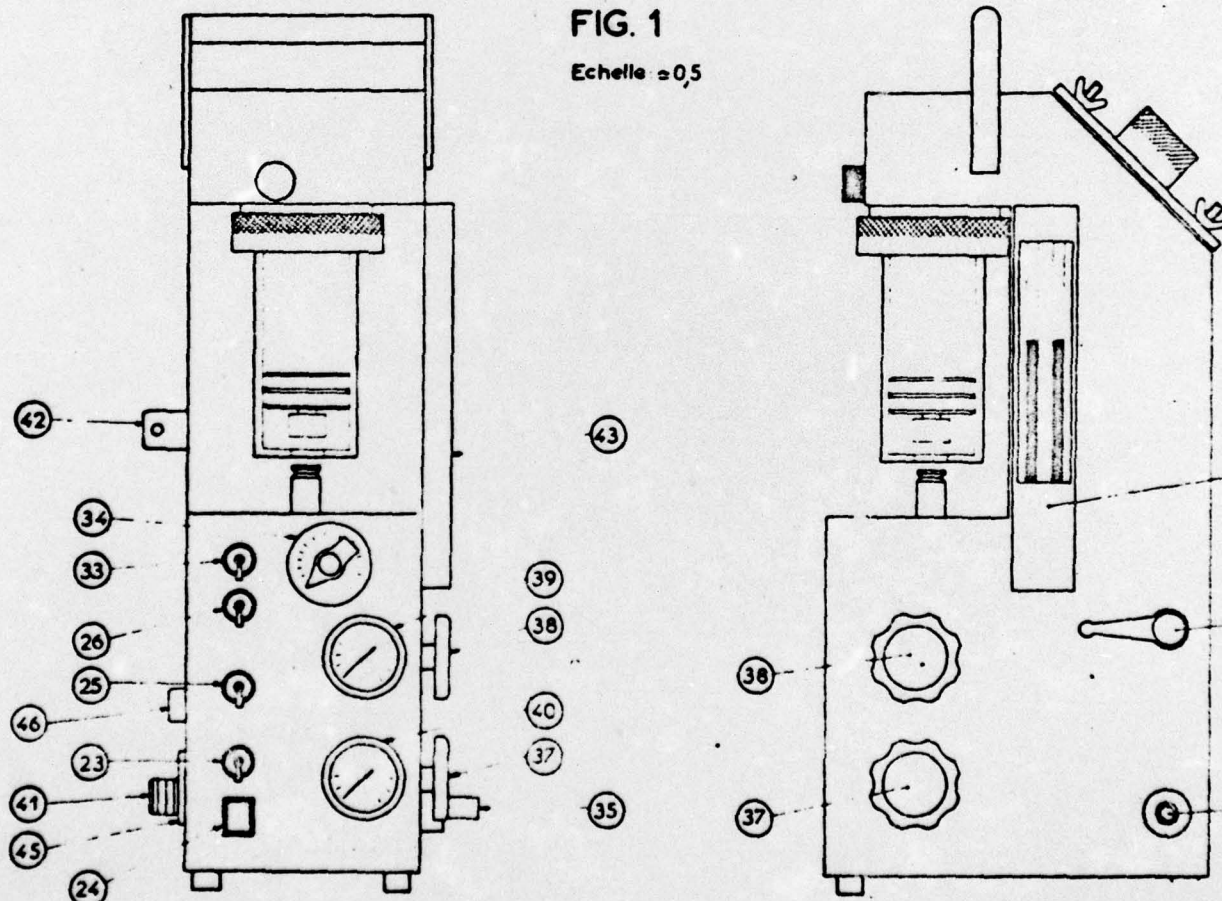
MUL-0447

NOMENCLATURE OF THE APPARATUS PARTS

- 23 -- General switch for electric current
- 24 -- Signal light
- 25 -- Grinding motor switch
- 26 -- Piston switch
- 33 -- Inverter of the piston thrust
- 34 -- Potentiometer for regulating piston speed
- 35 -- Orifice of the fluid input
- 36 -- Pipe valve
- 37 -- Needle valve: for regulation of venturi pressure
- 38 -- Needle valve: for regulation of micronizer pressure
- 39 -- Manometer: micronizer pressure
- 40 -- Manometer: venturi pressure
- 41 -- Secondary orifice for exit to the outside
- 42 -- Pipe valve
- 43 -- Mercury manometer: control of supply reservoir level
- 45 -- Electric supply
- 46 -- Fuse

FIG. 1

Echelle = 0,5



The micronizer is thus the essential part of the generator. It grinds, on the one hand, by the action of particles colliding against each other or against the walls of the grinding chamber and, on the other hand, it provides for particle size selection according to particle mass. In effect the centrifugal force created by the turbulent flux of compressed fluid carries the particles toward the chamber walls, but gradually as their size is diminished by the effect of repeated collisions, they come together in the center of the grinding chamber. When the particles are sufficiently fine and buoyant, they are carried to the outside by means of an orifice oriented with the axis of symmetry of the micronizer chamber. This orifice can be provided with a tornado.

The lyophilized product is introduced into the micronizer by a supply line which carries three elements, a venturi, a reservoir with a piston and a grinder blade.

The two electric motors which act on the inflow line are governed and regulated by an electric circuit. Finally, a circuit of compressed fluid (air or N_2) assures the distribution and regulation of pressures to the venturi of the supply line and the micronizer.

CONCLUSION

In this technical resume, we have described an aerosol generator for dried products. This apparatus functions on the principle of a blast-pipe grinder. Its delivery is of the order of 1 gm of dry material per minute. The sizing of the powder obtained corresponds to the optimal conditions for aerosol vaccination.